EPCRA Section 313 Toxic Release Inventory (TRI) Reporting
Naval Base Point Loma
Reporting Year 2020

1.0 PURPOSE

This document summarizes the results of Toxic Release Inventory (TRI) compliance reporting efforts for Naval Base Point Loma (NBPL) for Reporting Year (RY) 2020. Annual TRI reporting is governed by regulations established under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA Section 313), as interpreted by United States (U.S.) Department of Defense (DoD) and Department of Navy (Navy) policy and guidance. This document was prepared by MMEC Group under Contract Number N62470-16-D-2405, Delivery Order N6247318F4764.

2.0 LOCATION

NBPL is in San Diego on the Point Loma Peninsula that stands at the entrance to San Diego Bay. The base is situated on the western side of San Diego Bay approximately 1 mile west of Naval Air Station North Island (NASNI). Its western side lies along the Pacific Ocean.

3.0 MISSION

NBPL's mission is to enable and sustain "fleet, fighter, and family" readiness through consistent, standardized, and reliable shore support while preserving the critical resources necessary to secure the future of U.S. forces.

NBPL provides pier-side berthing and support services for submarines of the U.S. Pacific Fleet. Six attack submarines, three torpedo weapons retrievers, and a floating drydock are home ported at the base.

4.0 PRIMARY TENANT COMMANDS LOCATED AT THE FACILITY

NBPL is home to Commander, Third Fleet; Commander, Submarine Squadron ELEVEN; Mine Counter Measures Class Squadron; and Commander, Military Sealift Command (MSC) Pacific; Submarine Learning Center San Diego Detachment; and six attack submarines. The base comprises 316 acres, although most facilities are on approximately 30 acres of relatively flat land.

The following are the major Tenant Commands at this contiguous facility:

- *Commander Submarine Squadron ELEVEN* – CSS-11 is the U.S. Pacific Fleet Representative West Coast for submarine forces and oversees six nuclear-powered, fast-attack submarines and one drydock facility home ported at NBPL.
- *Naval Information Warfare Center (NIWC) Pacific* – NIWC Pacific is the Navy's principal research and development, test and evaluation, engineering, and fleet support center for command, control, and communications systems and ocean surveillance systems.
- *Navy Supply Fleet Logistic Center San Diego (NSFLCSD)/Defense Fuel Supply Point (DFSP)* – NSFLCSD/DFSP has the capacity to store 3,298,000 gallons (gal) of petroleum products in numerous aboveground storage tanks (ASTs). These products are delivered to DoD, Department of Homeland Security, and allied ships through 30 miles of piping and 3,000 valves at a 964-foot pier.

- *Southwest Regional Maintenance Center (SWRMC*) – SWRMC provides non-nuclear maintenance and repair services for the attack submarines based at SUBASE. It also manages and operates the floating drydock (ARCO [ARDM 5]).
- *Fleet Readiness Center Southwest (FRCSW*) *Plating Shop* – FRCSW is on the NIWC Pacific site at NBPL, but is not affiliated with NIWC. The shop's purpose is to plate and paint metal parts for aircraft, ships, submarines, and other Navy weapon systems. It is affiliated with FRCSW operations at Naval Base Coronado. The plating shop did perform painting and plating operations in 2019 but ceased operations late in the year and will not be resuming them.
- *Portsmouth Naval Shipyard (PNSY) Detachment San Diego* – PNSY Detachment San Diego has responsibility for all intermediate level maintenance (continuous maintenance) for the submarines at NBPL. This intermediate level maintenance facility provides a level of repairs beyond that accomplished by Ship's Force, but not requiring the full range of capabilities provided by a full service shipyard such as PNSY.
- *Magnetic Silencing Facility Point Loma* – Magnetic Silencing Facility Point Loma ascertains the magnetic signature of naval vessels and, if it is too large, reduces that signature so that the ships are not as likely to attract mines. This facility is composed of the Degaussing Facility and the Deperming Pier.

5.0 RECENT TRI REPORTING HISTORY

NBPL submitted U.S. Environmental Protection Agency (USEPA) Form R reports for the following chemicals/years:

- Naphthalene (2002, 2004–2019)
- Lead (2007–2019)
- Ethylbenzene (2004–2015)
- Benzene (2005–2015)
- Glycol ethers (2006–2008)
- Zinc compounds (2010)
- Xylene (2016 and 2017)

6.0 HAZARDOUS MATERIAL AND TRI CHEMICAL DATA

TRI requires submittal of a Form R for any listed toxic chemical exceeding one of the following thresholds:

- 25,000 pounds (lb) per year for chemicals manufactured onsite
- 25,000 lb per year for chemicals processed onsite
- 10,000 lb per year for chemicals otherwise used onsite
- 100 lb per year for per- and polyfluoroalkyl substances (PFAS)
- Chemical-specific thresholds for persistent bioaccumulative toxic (PBT) chemicals
    - 0.1 gram per year for dioxin and dioxin-like compounds

- o 10 lb per year for benzo[g,h,i]perylene, chlordane, heptachlor, hexachlorobenzene, isodrin, mercury, mercury compounds, octachlorostyrene, pentachlorobenzene, polychlorinated biphenyls (PCBs), and toxaphene
- o 100 lb per year for aldrin, lead, lead compounds, methyoxychlor, pendimethalin, polycyclic aromatic compounds (PACs), tetrabromobisphenyl A, and trifluralin

Section 7321 of the National Defense Authorization Act (NDAA) for Fiscal Year 2020 (P.L.116-92) added 172 individual PFAS chemicals to the TRI list of chemicals with an effective date of January 1, 2020. RY2020 Form R reporting is required for any of these PFAS chemicals individually exceeding the 100-lb-per-year otherwise used quantity threshold. The NBPL threshold evaluation for these chemicals is presented in Section 6.12.

Per USEPA instruction, the TRI manufactured, processed, and otherwise used threshold evaluations are performed independently. For example, the amount of an individual TRI chemical manufactured is not counted toward the amount processed or the amount otherwise used.

From a TRI perspective, toxic chemicals are primarily otherwise used at NBPL. There is some processing of toxic chemicals and, to a lesser extent, toxic chemical manufacture in the form of fuel combustion byproducts. However, based on fuel combustion byproduct manufacture calculations performed at other Navy installations in the southwest (e.g., NASNI), it is highly unlikely that NBPL exceeds a TRI chemical manufacturing threshold.

Otherwise used and processed toxic chemicals at NBPL are addressed in the remainder of Section 6.0 and are summarized in Section 7.0.

Hazardous materials for NBPL organizations are distributed from the NAVSUP FLC Hazardous Material Minimization (HAZMIN) Center in Building 3322 at Naval Base San Diego (NBSD). TRI chemical usage associated with hazardous materials issued from the HAZMIN Center is addressed in Section 6.1.

Key NBPL organizations that do not obtain their hazardous materials from the HAZMIN Center are NSFLCSD/DFSP, NIWC Pacific, FRC Plating Shop, SWRMC, ARCO (ARDM 5), PNSY, and the Small Arms Range (SAR). TRI chemical threshold information for these organizations is presented in Sections 6.2 through 6.8, respectively. TRI chemical use in the Naval Facilities Engineering Systems Command Southwest (NAVFAC SW) Transportation Shop is addressed in Section 6.9. Additionally, TRI chemicals in bilge water received from ships and then treated at the NBPL Oily Water Treatment Plant (NBPL OW) must be counted toward the TRI threshold (discussed in Section 6.10). TRI chemicals in gasoline and diesel fuel used to power non-motor vehicles on base must be counted toward the TRI otherwise used threshold (discussed further in Section 6.11). Finally, PFAS chemicals used in fire suppression are discussed in Section 6.12.

6.1 HAZMIN Center

Data regarding 2020 TRI chemical quantities issued to NBPL activities through the HAZMIN Center were obtained from the Enterprise Resource Planning (ERP) database by Charles Roiz of NAVSUP FLC.

ERP is a data management system implemented by NAVSUP FLC in 2012. It tracks HAZMIN Center issuance of hazardous materials to individual organizations on base and off base. Information captured includes date of issue, number of containers issued, and total issue weight. Chemicals in each hazardous material issue are tracked using Safety Data Sheet (SDS) information maintained within ERP. Quantities of individual chemicals issued to NBPL work centers and shops can be determined for the calendar year with the ERP Usage Report (ZRMIM0010). When more detail is required to track a specific chemical, the ERP Transaction History Report (ZRMMD0006) can be used to identify the shops using the chemical and the specific hazardous materials that contain the chemical.

NAVSUP FLC personnel ran the ERP Usage Report for calendar year 2020 at NBPL. MMEC Group personnel sorted and summed these data to yield individual chemical issue quantities by Chemical Abstracts Service (CAS) number for each chemical in the hazardous materials issued during the year. From these data, TRI chemical issues for 2020 were compiled using MMEC Group's comprehensive listing of TRI chemicals and compound categories by CAS number.

Only "301" and "501" transactions from the HAZMIN Center were extracted from the ERP Usage Report. These transactions represent hazardous material issues from the HAZMIN Center to the work centers (301 "bin issues") and direct issues to the work centers that do not physically pass through the HAZMIN Center (501 issues). Scrapped items ("551") and bin-to-bin transfers ("309") were not extracted from the ERP Usage report, because that would constitute double counting according to NAVSUP FLC personnel.

The data from the ERP report do not include TRI chemicals issued to ships ported at NBPL or other offsite locations. Materials issued to ships from the HAZMIN Center become part of the ship's operation and are not counted toward the shore installations threshold. The following excerpt is from the Office of the Chief of Naval Operations Environmental Readiness Program Manual (OPNAV M-5090.1), Chapter 26-1.3, page 26-3:

> *Any toxic chemical stored or used aboard a ship while in port does not become part of the shore facility's threshold calculations and is not reported by the shore facility even if reporting is triggered. Material maintained under the ship's custody is not subject to any EPCRA reporting requirements.*

Note that the NBPL hazardous material and chemical issue data provided by NAVSUP FLC are distinguishable from data from the other Navy installations served from the NBSD HAZMIN Center.

Based on the data in the NBPL ERP report, quantities of materials issued from the HAZMIN Center have been on a steady decline over the past few years. The TRI chemical usage quantities from the ERP report were negligible for 2020 and are not presented in this report. Of the materials identified in the ERP report as issued at NBPL during 2020, most were janitorial or building maintenance products, which are exempt from reporting under the TRI routine janitorial/facility grounds maintenance and structural component exemptions.

6.2 NSFLCSD/DFSP

Hazardous materials that are managed through NSFLCSD/DFSP include the following:

- Jet propellant (JP)5 (jet fuel containing benzene, ethylbenzene, and naphthalene)
- F76 Navy distillate (diesel fuel marine [DFM]) (ship fuel typically containing naphthalene and xylene)
- Fuel system icing inhibitor (FSII) (containing diethylene glycol monomethyl ether – a TRI glycol ether)

- Marine engine oil – 9250 oil (containing zinc compounds at 1–2.5 percent [%])[1]
- Turbine oil – 2190 TEP (containing no TRI chemicals at concentrations above their de minimis level)[2]
- Fuel oil reclaim (FOR) (material reclaimed and sold by NSFLCSD/DFSP Point Loma from treatment of oily wastewater)

6.2.1 JP5

JP5 is delivered to NSFLCSD/DFSP via pipeline, barge, and tank truck and is stored in large tanks. It is pumped to ships from these storage tanks.

A variety of ships refuel at NSFLCSD/DFSP, including Navy, MSC, DoD, Department of Homeland Security, U.S. Army, U.S. Coast Guard, and National Oceanic and Atmospheric Administration vessels, and foreign ships. Most ships refuel with DFM and JP5, depending on their requirements. The ships can be refueled directly at NSFLCSD/DFSP or from yard oilers (Southern California [SOCAL] Oilers) used to transport fuel from NSFLCSD/DFSP to ships at sea. The oilers account for approximately 70% of JP5 and DFM volume distributed from NBPL. NSFLCSD/DFSP also supplied NASNI and Marine Corps Air Station (MCAS) Miramar with approximately 12 million gal and 20 million gal of JP5, respectively, in 2020.

Fuels at Navy facilities are usually exempt under the TRI “motor vehicle maintenance” exemption. However, fueling of transient and non-DoD vehicles is not covered under this exemption, according to Navy TRI guidance.[3,4,5] Transient vehicles are considered those that are not stationed or home ported at the facility and are simply “using the base as a gas station or rest stop.” A large percentage of the ships fueled by NSFLCSD/DFSP are either transient or non-DoD.

To identify TRI chemicals in JP5, the JP5 supplier for Navy facilities in the San Diego metro area was identified through emails with the Defense Logistics Agency (DLA) personnel overseeing JP5 and DFM supplied to Navy facilities. According to Jennifer Bertone, Supply Planner for Energy Americas West, all JP5 supplied to NSFLCSD/DFSP during fiscal year 2020 originated from the Valero Benicia Refinery near San Francisco, California (CA).[6]

The Valero SDS for jet fuels indicates only ranges of chemical constituents for a wide variety of different jet fuels (e.g., Jet A, JP8, and Jet Fuel Stock), inclusive of JP5. April Twu (Environmental Engineer, Valero Refining Company – CA, Benicia Refinery) was contacted for more precise information on TRI chemicals in the JP5 supplied to DFSP Point Loma. She

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[1] 9250 Oil is supplied by Chevron, according to Steve Frey, NSFLCSD, Southwest Regional Fuels Director, in an email on May 8, 2020. The SDS (September 16, 2019) indicates that zinc compounds are present from 1 to 2.5%. No other TRI chemicals are present at concentrations above their de minimis levels.

[2] 2190 TEP is supplied by Chevron, according to Steve Frey, NSFLCSD, Southwest Regional Fuels Director, in an email on May 8, 2020. The Chevron SDS for this material shows no TRI chemicals present at concentrations above their de minimis levels. https://cglapps.chevron.com/sdspds/SDSDetailPage.aspx?docDataId=25954&docFormat=PDF

[3] *How to Consider Fuel Thresholds under EPCRA Section 313,* June 2010, pages 5 and 6. This document is an addendum to *Getting Started with the Emergency Planning and Community Right-to-Know Act (EPCRA) – A Basic Guidance Document for Navy Facilities,* May 2009.

[4] *Questions and Answers for the Emergency Planning and Community Right-to-Know Act – A Companion to the Getting Started with EPCRA Document for Navy Facilities*, September 2002, Question #145.

[5] *Consolidated EPCRA Policy for DoD Installations, Munitions Activities, and Operational Ranges,* September 21, 2006, page 19.

[6] Email dialog with Jenifer Bertone, jennifer.bertone@dla.mil, March 20, 2021.

provided the following JP5 composition data that Valero uses for TRI calculations at the refinery:[7]

- Naphthalene at 0.37%
- Ethylbenzene at 0.075% (less than de minimis limit of 0.1% for this chemical)
- Benzene at 0.005% (less than de minimis limit of 0.1% for this chemical)[8]
- Xylene at 0.48% (less than de minimis limit of 1% for this chemical)
- Toluene at 0.06% (less than de minimis limit of 1% for this chemical)
- 1,2,4-Trimethylbenzene at 0.57% (less than de minimis limit of 1% for this chemical)
- Cyclohexane at 0.08% (less than de minimis limit of 1% for this chemical)

According to Michael Carter (Southwest Regional Fuels Director, NAVSUP FLC San Diego), 32,467,390 gal of JP5 were received at NSFLCSD/DFSP in calendar year 2020. As discussed earlier, this fuel cannot be considered exempt from TRI reporting – including the amount transferred from NSFLCSD/DFSP to NASNI and MCAS Miramar (which is considered processed for TRI purposes).[9]

Fuel provided to transient vehicles is considered “otherwise used” under Navy interpretations of TRI reporting rules and thus the 10,000-lb-per-year threshold applies. The 25,000-lb-per-year processed threshold applies to the quantity transferred to NASNI and MCAS Miramar via pipeline. Based on the JP5 chemical composition data provided by the supplier and the large volume handled at NSFLCSD/DFSP, naphthalene requires a Form R for 2020.

6.2.2 Diesel Fuel Marine

At NSFLCSD/DFSP, DFM is processed in a manner similar to that for JP5. As such, it cannot be exempted from TRI reporting. DFM was supplied by BP West Coast (75%) and Tesoro (25%) in 2020, according to Jennifer Bertone of the DLA. The SDSs for diesel marine fuel from both suppliers indicate that it contains naphthalene at quantities greater than de minimis levels.[10] The SDS from Tesoro indicates that xylene is also present in DFM at 1–5%, which is above de minimis levels.

According to Michael Carter (Southwest Regional Fuels Director, NAVSUP FLC San Diego), 66,411,809 gal of DFM were received at NSFLCSD/DFSP in calendar year 2020. Because the TRI reporting threshold for naphthalene has already been surpassed based on JP5, the naphthalene in the DFM must also be considered for release estimation purposes. Because of the large quantity of DFM supplied in 2020, it is assumed that the reporting threshold for xylene has also been exceeded.

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[7] Email dialog with April Twu, Staff Environmental Engineer, Valero Benicia Refinery, (707) 745-7573, April.Twu@valero.com, March 29, 2021.

[8] Based upon the updated JP5 composition data received from Valero, ethylbenzene and benzene amounts are below de minimis levels; therefore, the amounts of these chemicals in JP5 are not factored in the threshold determination.

[9] *EPCRA Section 313 Questions and Answers, 2019 Consolidation Document*, EPA 745-B-19-001, Question #224, USEPA.

[10] Tesoro SDS for Marine Gas Oil dated January 10, 2017 shows naphthalene present at 1-5%. BP SDS for Marine Diesel Oil dated March 12, 2020 shows naphthalene present at 1-3%. Synonyms include Diesel Naval 3GP-15, Diesel Marine Gas Oil, and Diesel Naval 3GP-11, among over 20 synonyms.

6.2.3 Fuel System Icing Inhibitor

This material is composed of nearly 100% diethylene glycol monomethyl ether (CAS 111-77-3 and also known as methyl carbitol), which is part of the TRI glycol ether category.

According to Michael Carter (Southwest Regional Fuels Director, NAVSUP FLC San Diego), the JP5 received already contains FSII, and the injection process is maintained at NSFLCSD/DFSP for redundancy.[11] No FSII was used in 2020, according to Michael Carter.[12] Note that the FSII is in the JP5 received at NBPL at a concentration of less than 1%, which is below the TRI de minimis concentration limit for glycol ethers.

6.2.4 Marine Engine Oil – 9250 Oil

A total of 0 gal of 9250 Oil were distributed by NSFLCSD/DFSP in 2020.[13] This oil is provided to ships that stop at the NBPL pier. This marine engine lubricating oil is received by tank truck at NSFLCSD/DFSP and is stored in two tanks – one holds 10,000 gal and the other holds 25,000 gal. NSFLCSD/DFSP tank trucks are filled from these tanks. The trucks are driven to the pier to deliver the 9250 Oil to holding tanks onboard the ships. This material is not a fuel and is not covered under DoD TRI interpretations that fuel is considered otherwise used. This material, when used, would be considered processed at NBPL.

6.2.5 Fuel Oil Reclaim

The FOR is a gravity separation operation that receives (1) oily wastewater and oily wastes primarily from submarines and ships visiting NBPL; and (2) liquid oily wastes from NSFLCSD/DFSP operations. NSFLCSD/DFSP sells oil reclaimed from the FOR, periodically transfers sludge materials accumulated in the FOR offsite for treatment and disposal, and discharges treated wastewater to City of San Diego sanitary sewers.

Because the FOR is basically a phase separation process with the resulting oil sold into commerce, the TRI chemicals in the recovered oil are considered processed and are subject to the 25,000-lb-per-year TRI reporting threshold.[14] This amount includes, at a minimum, all of the water-insoluble organic TRI chemicals in the oil. It is unclear whether the TRI inorganic chemicals (e.g., metals and metal compounds) would also be considered processed. As a conservative approach, it is assumed that these inorganic TRI chemicals must be included in the otherwise used threshold evaluation (10,000 lb per year). Additionally, the de minimis exemption is not applied here because a portion of the chemicals entering the plant is from offsite wastes. In 2020, the quantity of oil recovered was 1,119,510 gal.[15]

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[11] Michael Carter email, June 3, 2021.

[12] Michael Carter email, June 3, 2021.

[13] Michael Carter email, June 3, 2021.

[14] Section 6.10 (NBPL Oily Waste Plant) presents a more detailed explanation for why wastes from offsite must be counted toward TRI thresholds. The FOR is addressed in a manner similar to that for the NBPL Oily Waste Plant in terms of the TRI threshold evaluation, with one key difference – the oil recovered from the FOR is sold directly into commerce, while the oil recovered from the NBPL OW is sent to NASNI for further treatment/processing prior to distribution in commerce.

[15] Michael Carter email, June 3, 2021.

No analytical data are available characterizing the chemical composition of the oil recovered and sold from the FOR. Assuming that the TRI chemical composition of this material is similar to that of the oil recovered from the NASNI Oily Water Treatment Plant (OW), the amount of TRI chemicals in the FOR oil can be estimated as follows:[16,17]

- 0.5 milligram per liter (mg/L) lead x 1,119,510 gal x 3.78 liters per gal (L/gal) x 1 lb/453,590 mg = 4.8 lb
- 6.7 mg/L benzene x 1,119,510 gal x 3.78 L/gal x 1 lb/453,590 mg = 62 lb
- 489 mg/L naphthalene x 1,119,510 gal x 3.78 L/gal x 1 lb/453,590 mg = 4,562 lb
- 163 mg/L ethylbenzene x 1,119,510 gal x 3.78 L/gal x 1 lb/453,590 mg = 1,517 lb
- 1,896 mg/L 1,2,4-trimethylbenzene x 1,119,510 gal x 3.78 L/gal x 1 lb/453,590 mg = 17,691 lb
- 94 mg/L toluene x 1,119,510 gal x 3.78 L/gal x 1 lb/453,590 mg = 878 lb
- 74 mg/L phenathrene x 1,119,510 gal x 3.78 L/gal x 1 lb/453,590 mg = 694 lb
- 610 mg/L m,p xylene x 1,119,510 gal x 3.78 L/gal x 1 lb/453,590 mg = 5,693 lb
- 349 mg/L o-xylene x 1,119,510 gal x 3.78 L/gal x 1 lb/453,590 mg = 3,259 lb
- 18 mg/L zinc x 1,119,510 gal x 3.78 L/gal x 1 lb/453,590 mg = 164 lb (assumed to be in the form of zinc compounds)

6.2.6 NSFLCSD/DFSP TRI Threshold Summary

The preceding NSFLCSD/DFSP contributions to the NBPL TRI otherwise used threshold are summarized as follows and have been transcribed to Table 4 in Section 7.0:

- Naphthalene = >10,000 lb from JP5[18]
- Lead = 4.8 lb from FOR
- Xylene = > 10,000 lb from DFM
- Zinc compounds = 164 lb from FOR

The NSFLCSD/DFSP contributions to the NBPL TRI processed threshold are summarized as follows and have been transcribed to Table 5 in Section 7.0:

- Zinc compounds = 0 lb from 9250 Oil
- Naphthalene = 4,562 lb from FOR and > 25,000 lb JP5 to NASNI and MCAS Miramar[19]
- Ethylbenzene = 1,517 lb from FOR
- Benzene = 62 lb from FOR
- 1,2,4-Trimethylbenzene = 17,691 lb from FOR
- Toluene = 878 lb from FOR

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[16] NASNI recovered oil chemical composition data obtained from laboratory analysis of recovered oil samples. For metals and organics, the data are an average of quarterly samples collected from the NASNI OW recovered oil tanks over the past 4 years.

[17] The amount of TRI chemicals leaving the FOR in wastewater and sludge must also be addressed in the threshold evaluation (because some of the waste processed is received from offsite); however, these quantities are very small and do not affect the final results.

[18] The DoD considers fuels issued to transient vehicles “otherwise used” versus “processed” for TRI purposes.

[19] Fuel transferred from NBPL to NASNI and MCAS Miramar is considered “processed.”

- Phenathrene = 694 lb from FOR
- Xylene = 8,952 lb from FOR

6.3 NIWC Pacific

NIWC Pacific maintains hazardous material usage separately from the rest of NBPL. Mark Lacy and Lauren Brown of NIWC Pacific supplied usage information on the following specific chemicals relevant to the NBPL TRI threshold evaluation for RY2020:[20]

- Lead – 6 lb
- Naphthalene – 385 lb
- N-Methyl-2-pyrrolidone – 7 lb
- 4,4-Diaminodiphenyl methane – 7 lb
- Diisocyanates – 102 lb
- 2,4-toluene diisocyanate – 35 lb

6.4 FRC Plating Shop

This shop formerly fabricated parts and components for various DoD clients, including NIWC Pacific, MCAS Miramar, and various aircraft, ships, and submarines. The plating shop did perform painting and plating operations in 2019 but ceased operations late in the year and will not be resuming them.

6.5 Southwest Regional Maintenance Center Contractors

SWRMC is the Navy organization that oversees contractors that perform ship repairs. Toxic chemicals used by contractors working for SWRMC on boats in drydock are not exempt from TRI reporting (in contrast to toxic chemicals used by sailors in their routine operation and maintenance of watercraft). To quantify SWRMC contractor toxic chemical usage, data from SWRMC's 2020 hazardous material usage spreadsheets were coupled with toxic chemical composition data extracted from SDSs for the items used.[21] SWRMC requires contractors to provide information on hazardous material usage and chemical composition to meet reporting requirements under state and local air pollution regulations. The SWRMC data are divided into six material categories discussed individually below and summarized in Tables 1 and 2.

6.5.1 SWRMC Welding Materials

A total of 7 lb of welding rods and other similar materials were used by SWRMC contractors at NBPL in 2020. Usage data for individual welding materials were combined with chemical composition data in the 2020 SWRMC Weld Rod Emissions Inventory Excel® Workbook to yield the TRI chemical usage quantities in Table 1. These metals are counted toward the processed threshold because they are intended to stay with the product of the operation – repaired ships.

6.5.2 SWRMC Solvents

No solvents were used at NBPL by SWRMC contractors in 2020 according to the SWRMC Coatings–Solvents Excel® Workbook. If there were any solvents used, the TRI chemicals within them would be counted toward the otherwise used threshold.

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[20] Email from Mark Lacy and Lauren Brown of NIWC Pacific, June 1, 2021.

[21] Data provided by Paul Clifford, Air Program Manager SWRMC, to Natalie Baum, MMEC Group, on January 29, 2021.

6.5.3 SWRMC Abrasives

No abrasives were used at NBPL by SWRMC contractors in 2020 according to the SWRMC Abrasive Blasting Excel® Workbook. If there were any abrasives used, the TRI chemicals in the abrasives would be counted toward the otherwise used threshold.

6.5.4 SWRMC Paints

A total of 24 gal of paints were used in 2020 by SWRMC contractors at NBPL. Usage data for individual paints (obtained from the SWRMC Coatings–Solvents Excel® Workbook) were combined with chemical composition data obtained from their SDSs to yield the TRI chemical usage quantities in Tables 1 and 2. The metal compounds in the paints are counted toward the processed threshold because they are intended to stay with the product of the operation (repaired ships). The solvents are considered otherwise used.

6.5.5 SWRMC Diesel Use in Non-Motor Vehicle Internal Combustion Engines

No diesel fuel was used at NBPL by SWRMC contractors in 2020 in various self-propelled and non-self-propelled equipment according to the SWRMC EPCRA Fuel Usage Excel® Workbook. If there was any diesel fuel used, the TRI chemicals in the fuel would be counted toward the otherwise used threshold.

6.5.6 SWRMC Adhesives

No adhesives were used in 2020 by SWRMC contractors according to the SWRMC Emissions Inventory Adhesives Report Excel® Workbook. If there were any adhesives used, the TRI chemicals within them would be counted toward the otherwise used threshold.

6.5.7 Summary for SWRMC

The TRI chemical usage totals from the preceding SWRMC categories yields the following processed and otherwise used totals:

Table 1. SWRMC TRI Processed Chemicals

Chemical	Welding lb	Paints lb	Total lb
Manganese	0	0	0
Chromium	0	0	0
Nickel	0	0	0
Copper	0	0	0
Aluminum	0	0	0
Zinc Compounds	0	0	0
Copper Compounds	0	0	0
Nickel Compounds	0	0	0

lb = pound(s)

Table 2. SWRMC TRI Otherwise Used Chemicals

Chemical	Solvents lb	Paints lb	Adhesives lb	Abrasives lb	Diesel Fuel lb	Total
Methanol	0	1	0	0	0	1
Naphthalene	0	8	0	0	0	8

lb = pound(s)

6.6 ARCO (ARDM 5)

ARCO (ARDM-5) is an asset of the Pacific Submarine force, used primarily to drydock nuclear-powered, fast-attack submarines to facilitate maintenance efforts. ARCO (ARDM 5) is certified by the Naval Sea Systems Command to lift vessels displacing up to 7,800 long tons.

This shop is issued hazardous material from the HazMin Center for use by sailors in maintaining their ships/submarines, according to Andrew Murphey (Supply/Safety Officer for ARCO [ARDM 5]).[22] For example, paints are issued to sailors to perform touch-up painting on ships/submarines. The work is performed by sailors and not contractors or civilians; thus, toxic chemical use by this organization is exempt under Navy TRI interpretations of the motor vehicle maintenance exemption (i.e., this is operational-level maintenance of the submarines).[23]

6.7 Portsmouth Naval Shipyard San Diego Detachment

PNSY San Diego Detachment currently operates the Nuclear Regional Maintenance Department at NBPL. Hazardous material usage was tracked in 2020 using Hazardous Material Management System (HMMS) software maintained by PNSY personnel. TRI chemical usage results for 2020 were obtained from HMMS and are summarized as follows.[24] These chemicals are presumed to be otherwise used:

- 1,2,4-Trimethylbenzene – 28 lb
- Copper – 0 lb

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22 Phone conversation with Andrew Murphey, ARCO and Natalie Baum, MMEC Group, July 7, 2021.

23 *Navy CECOS EPCRA and TRI Reporting Student Guide* (CIN #A-2A-0082), Version 3.1, Topic 5b, page 9, November 2020.

24 Email correspondence with Christian Kost, ESH manager PNSYDETSD, May 19, 2021.

- Cumene – 3 lb
- Dibutyl phthalate – 2 lb
- Ethylbenzene – 19 lb
- Ethylene glycol – 135 lb
- Hexane – 7 lb
- Methanol – 0 lb
- N-Butyl alcohol – 93 lb
- Naphthalene – 0 lb
- Toluene – 8 lb
- Xylene – 48 lb
- Zinc – 0 lb

PSNY is in the process of taking over an area previously occupied by FRC at NBPL which will add powder coating and spray paint booths to the operation.

6.8 NBPL Small Arms Range

Munitions use at the SAR is tracked thoroughly by munitions type (e.g., 9-millimeter [mm] cartridges and 12-gauge shotgun cartridges). The annual results for 2020 were provided by the SAR Manager via email on January 19, 2021 and were entered by MMEC Group personnel into the DoD Toxics Release Inventory Data Delivery System (TRI-DDS) to calculate TRI chemical use at the SAR.

TRI-DDS 2020 results for otherwise used chemicals at the SAR are as follows:

- Antimony – 25 lb
- Antimony compounds – 1 lb
- Arsenic – 1 lb
- Barium compounds – 2 lb
- Copper – 196 lb
- Lead (PBT) – 1,292.7 lb
- Lead compounds (PBT) – 2.3 lb otherwise used, 0.9 lb manufactured
- Nitroglycerin – 4 lb

6.9 NAVFAC SW Transportation Shop

Chemical use for maintenance of facility-based motor vehicles is exempt from TRI reporting; however, maintenance of offsite vehicles is not exempt from TRI reporting. According to Tim Conium of NBPL NAVFAC SW Transportation (619) 553-3217, vehicles serviced at the NBPL NAVFAC SW Transportation Shop at Building 20 are from both onsite and offsite. However, overall material usage is low because they service only 900 vehicles per year. Materials issued to this shop are tracked by the HAZMIN Center and would already be presented with the data in Section 6.1.

6.10 Oily Wastewater from Offsite Treated at the NBPL Oily Waste Plant

Processing and treatment of wastes received from offsite potentially must be addressed in the TRI threshold evaluation per USEPA instructions. At NBPL, bilge water and other oily wastes from submarines and ships are piped in from the North, South, and Middle Piers into the NBPL OW. Most of this waste is generated while the vessels are docked at the piers and undergoing maintenance, although some is generated while they are out at sea and is transferred to the NBPL OW upon arrival of the ship at NBPL. Also, rainwater from the ARCO (ARDM 5) dock basin is treated at the NBPL OW, but it represents only a small fraction of the treatment plant influent.

The oily wastewater is first pumped into load equalization tanks where the oil is allowed to separate from the water and then is transferred to Recovered Oil Storage tanks. The oil recovered from the NBPL OW is ultimately sent to the NASNI OW for further treatment. Water from the Load Equalization Tanks is then pumped to an oil/water separator where DWT 6234, DWT 672E, and sodium hydroxide are added to help break oily emulsions. (These materials do not contain any TRI chemicals.) The water then flows through an induced air flotation unit from which the treated water is discharged to San Diego Metropolitan Wastewater Department (MWWD) sanitary sewers that lead to a publicly owned treatment works (POTW).

Sludge removed from the water at the NBPL OW is pumped to a holding tank; from there it is then pumped to a filter press for dewatering. The pressed sludge is sent offsite as a hazardous waste, and the water removed from the sludge is pumped back to the load equalization tanks to be treated again.

USEPA’s definition of a facility does not include water (i.e., oceans, bays, rivers, etc.), and thus the waste received from boats and ships must be addressed as wastes received from offsite. Additionally, DoD guidance indicates that materials stored and used on a ship that remain under the ship’s ownership are not considered part of the shore-based facility. Thus, bilge water and other oily wastes received at the NBPL OW from boats and ships must be considered received from offsite.

Per USEPA instructions, TRI chemicals in wastes received from offsite into the facility for disposal, stabilization (without subsequent distribution in commerce), or treatment for destruction must be counted toward the otherwise used threshold. However, Question and Answer #20 from USEPA’s *EPCRA Section 313 Questions and Answers: Addendum to the Revised 1998 Version as of December 2004* states the following:

> *20. If a toxic chemical is derived from the phase separation of wastes received from offsite and that chemical is subsequently incorporated into a product at the facility and then distributed into commerce, has the toxic chemical been processed or otherwise used?*
>
> *If a facility receives materials containing toxic chemicals from offsite for further waste management and the toxic chemicals are treated for destruction, stabilized, or disposed onsite, the facility would be otherwise using the toxic chemicals. However, during phase separation the toxic chemical in the waste is not actually destroyed. Furthermore, the toxic chemical is incorporated into a product at the facility and is further distributed in commerce (e.g., retorted mercury sold for reuse in thermometers and mercury switches).*

*Thus, as long as the toxic chemical coming from the waste is not stabilized, treated for destruction, or disposed, it would not be otherwise used because it is neither treated for destruction nor disposed onsite. Because it is *distributed in commerce, it would be processed. Once a facility exceeds a threshold for a particular toxic chemical, amounts of that chemical that are released or otherwise managed as a waste must be calculated for all onsite activities.*

It is not entirely clear whether the TRI chemicals in the wastes received and managed through the NBPL OW should be addressed as processed or otherwise used, because the oil recovered from the NBPL OW is sent to the NASNI OW for further processing prior to distribution in commerce.[25] However, as the following paragraphs demonstrate, addressing the relatively small quantities of TRI chemicals managed through the NBPL OW (from both onsite and offsite) against both the processed and otherwise used thresholds will not affect TRI reporting results. Additionally, the de minimis exemption is not applied here because portions of the chemicals entering the treatment plant are wastes from offsite.

Data characterizing the volume and TRI chemical composition of the various waste streams entering the NBPL OW are not readily available. However, the amount of TRI chemicals entering the treatment plant by can be estimated by summing the quantity exiting the plant in the recovered oil stream, wastewater discharged to sanitary sewers, and dewatered sludge sent offsite.

Approximately 40,000 gal of oil recovered from the NBPL OW were sent offsite to NASNI in 2020 according to Noreas Environmental Services, Incorporated (NES) personnel operating the treatment plant. Assuming that the TRI chemical composition of this material is similar to that of the oil recovered from NASNI OW, the amount of TRI chemicals in the NBPL OW oil can be estimated by applying results from laboratory analyses of samples collected from the NASNI OW recovered oil tanks.[26] Table 3 presents these results.

Table 3. Chemical Concentration in NBPL OW Recovered Oil

Chemical	Concentration (mg/L)	Chemical Mass in OW Recovered Oil (lb)
Benzene	6.7	2
Naphthalene	489	163
Ethylbenzene	163	54
1,2,4-Trimethylbenzene	1,896	632
Toluene	94	31
m,p-Xylene	610	203
o-Xylene	349	116
Methylene Chloride	9	3
Phenanthrene	74	25
Copper	3	1
Lead	0.5	0.2
Mercury	0.0	0

[25] As discussed in Section 6.2.5, it is clear that the TRI chemicals in the wastes received and managed through the FOR should be addressed as processed because the recovered oil is distributed in commerce.

[26] NASNI recovered oil chemical composition data obtained from laboratory analysis of recovered oil samples. For metals and organics, the data are an average of quarterly samples collected from the NASNI OW recovered oil tanks over the past 5 years.

Nickel	0.7	0
Zinc Compounds	18	6

lb = pound(s); mg/L = milligram(s) per liter; OW = oily wastewater

A total of 960,810 gal of treated water were discharged from the NBPL OW to City of San Diego sanitary sewers in 2020. Assuming that the TRI chemical composition of the treated water from the NBPL OW is similar to that of the NASNI OW wastewater effluent, the amounts of TRI chemicals in the NBPL OW effluent can be estimated as presented in Table 4.[27]

Table 4. Chemical Concentration in NBPL OW Effluent

Chemical	Concentration (mg/L)	Chemical Mass in OW Effluent (lb)
Benzene	0.01	0.1
Ethylbenzene	0.04	0.3
Methylene Chloride	0.0	0
Toluene	0.04	0.3
Naphthalene	0.2	1.2
Phenol	0.1	0.9
Cadmium	0.4	3.1
Chromium	0.01	0.1
Copper	0.02	0.2
Lead	0.002	0.0
Nickel	0.04	0.3
Zinc	0.1	0.9

lb = pound(s); mg/L = milligram(s) per liter; OW = oily wastewater

A total of 1,880 lb of dewatered sludge were generated from the NBPL OW in 2020. Assuming that the TRI chemical composition of the dewatered sludge from the NBPL OW is similar to that of the dewatered sludge from the NASNI OW, the amounts of TRI chemicals in the NBPL OW sludge can be estimated as presented in Table 5.[28]

[27] NASNI OW effluent composition data are an average of quarterly samples collected since 2016.

[28] NASNI OW filter cake sludge composition data are an average of annual samples collected since 2011.

Table 5. Chemical Concentration in NBPL OW Sludge

Chemical	Concentration (mg/kg)	Chemical Mass in OW Sludge (lb)
Arsenic	1.8	0.0
Barium	881.8	1.7
Cadmium	25.3	0
Chromium	83.3	0.2
Cobalt	6.6	0
Copper	1,693.7	3.2
Lead	38.5	0.1
Molybdenum	49.2	0.1
Nickel	520.6	1.0
Silver	8.4	0.0
Vanadium	5.8	0.0
Mercury	0.1	0.0
Zinc	4,717.8	8.9
Benzene	0.2	0
Ethylbenzene	1.5	0
m, and p Xylene	4,318	8.1
o Xylene	4.1	0
Toluene	0.7	0
Naphthalene	9.3	0
MeCL2	5.3	0
1,2,4 TMB	15.5	0

lb = pound(s); mg/L = milligram(s) per liter; OW = oily wastewater

The overall totals of TRI chemicals entering the NBPL OW are thus estimated as follows:

- Copper – 4 lb
- Naphthalene – 164 lb
- Ethylbenzene – 54 lb
- Benzene – 2 lb
- Lead – 0.3 lb
- 1,2,4-Trimethylbenzene – 632 lb
- Toluene – 32 lb
- Phenathrene – 25 lb
- Mercury – 0 lb
- Nickel – 2 lb
- Barium – 2 lb
- Phenol – 1 lb
- Xylene – 327 lb
- Zinc compounds – 16 lb

Because quantities of naphthalene, xylene, and lead already exceed TRI thresholds, the contribution from the NBPL OW must be included in the Form R release totals as follows:

- Naphthalene to NASNI OW in recovered oil stream = 163 lb
- Naphthalene to POTW = 1 lb
- Naphthalene in filter cake = 0 lb
- Lead to NASNI in recovered oil stream = 0.2 lb
- Lead to POTW = 0.0 lb
- Lead in filter cake = 0.1 lb
- Xylene to NASNI OW in recovered oil stream = 319 lb
- Xylene to POTW = 0 lb
- Xylene in filter cake = 8.1 lb

6.11 Fuel Use in Non-Motor Vehicles

There are some non-motor-vehicle, non-exempt uses of diesel fuel at NBPL such as emergency generators, welders, pumps, cranes, and air compressors. Also, construction contractors use non-self-propelled equipment such as generators, compressors, pumps, and drilling equipment. No gasoline is used for these purposes at NBPL. Diesel fuel use information for these various items for 2013 (6,866 gal) was obtained from Rudy Urzua and Albert Mar, who are responsible for air emission inventory efforts for NAVFAC SW. More recent data are not available according to Mr. Mar; therefore, it is assumed that 2013 diesel fuel use for these purposes is not significantly different in 2020 than it was in 2013.[29]

The composition of diesel fuel was assumed to be 0.5% naphthalene and 0.5% ethylbenzene based on SDSs for several Exxon/Mobil diesel products. Naphthalene and ethylbenzene use in non-exempt diesel equipment was calculated to be the following based on a density of 7.3 lb per gal and 0.5%:

- Ethylbenzene – 251 lb
- Naphthalene – 251 lb

6.12 PFAS Used in Fire Suppression

For RY2020, 172 PFAS chemicals were added to the list of TRI chemicals that must be considered in the TRI threshold evaluation. PFAS chemicals have been a critical ingredient in aqueous film-forming foam (AFFF) used for fighting petroleum fires at airfields, aboard ships, and in industrial processes; however, the use of these chemicals is being phased out and restricted. AFFF is kept on hand at several locations at NBPL for use in emergency fire suppression.

[29] Email correspondence between Albert Mar of NAVFAC SW and Natalie Baum of MMEC Group, April 12, 2021.

For TRI purposes, reportable uses of AFFF at NBPL are as follows:

- Emergency use in fire suppression
- Firefighting training activities
- Additions of AFFF to tanks/systems

During 2020, no AFFF was used for fire suppression or in firefighting training.[30]

A large-scale effort to replace older AFFF products with a Military Specification (MILSPEC)-compliant AFFF in fire suppression systems has been in effect across Commander, Naval Region Southwest (CNRSW) installations, including NBPL. As a result, several NBPL systems/tanks equipped with AFFF containing PFAS chemicals at concentrations above 800 parts per billion (ppb) have had their AFFF replaced with MILSPEC-compliant AFFF.[31] The fire suppression systems identified in Table 6 were drained and refilled at NBPL during 2020. The amounts of PFAS chemicals in the MILSPEC-compliant AFFF added to these systems is counted toward the TRI reporting threshold in accordance with USEPA TRI reporting guidance relevant to closed systems.

Table 6. AFFF Additions to NBPL Units in 2020

Building	Tank Type	New AFFF Brand	Replacement Volume (gal)
Fire Station 110	Structural Apparatus	Ansulite AFC-3MS	30
Fire Station 110	Structural Apparatus	Ansulite AFC-3MS	60
Fire Station 111	Structural Apparatus	Ansulite AFC-3MS	77

AFFF = aqueous film-forming foam; gal = gallon(s)

A total of 167 gal of MILSPEC-compliant AFFF were added to the systems listed in Table 6 at NBPL in 2020. The SDS for Ansulite AFC-3MS does list two proprietary chemical types as components of the mixture (polyfluorinated alkyl polyamide and polyfluorinated alkyl quaternary amine chloride), but does not provide CAS numbers for these items to determine if they are TRI-listed PFAS chemicals.[32] However, as directed by Navy TRI guidance on PFAS chemicals, when AFFF manufactured after 2016 is used (as it was in 2020), a concentration of 25 ppb is to be used to determine PFAS chemical use.[33] Applying this concentration to the quantity of AFFF added in 2020 yields:

- 167 gal AFFF x 3.78 liters per gallon (L/gal) x 25 micrograms per liter (µg/L) x 0.0022 lb/gal / 1,000,000 micrograms per gram (µg/g) = 0.000035 lb of PFAS

Without individual PFAS compounds identified in the new AFFF added, the 25-ppb concentration is used for the collective quantity of PFAS chemicals. Given that the 100-lb-per-year TRI threshold for PFAS was not exceeded for the collective quantity of PFAS chemicals, it was concluded that no individual PFAS chemical quantities exceeded the reporting threshold for RY2020.

30 Email from Rob Chichester, NBPL IEPD to MMEC Group on June 15, 2021.

31 AFFF Execution Matrix data provided by Christina Graulau, NAVFAC SW Environmental Compliance Core, to MMEC Group on February 4, 2021.

32 SDS for Ansulite 3% AFFF dated January 2019 lists polyfluorinated alkyl polyamide (proprietary) at 1-5% and polyfluorinated alkyl quaternary amine chloride (proprietary) at 0.1-1%.

33 *Guidance Document for PFAS/PFOA Reporting Under the EPCRA,* December 31, 2020.

Additionally, the SDS for Ansulite AFC-3MS lists 2-(2-butoxyethoxy)ethanol (CAS No. 112-34-5) present in the mixture at 10-30%. This chemical falls under the glycol ether TRI chemical category (N230) and its use must be considered toward the otherwise used threshold evaluation. Using the mid point of the chemical composition range, 20%, yields the following the quantity of 2-(2-butoxyethoxy)ethanol in the Ansulite AFC-3MS added to the AFFF systems in 2020;

- 167 gal Ansulite AFC-3MS AFFF x 1.02 x 8.34 lb/gal x 0.20 lb 2-(2-butoxyethoxy)ethanol / lb AFFF = 284 lb 2-(2-butoxyethoxy)ethanol

7.0 TRI CHEMICAL THRESHOLD EVALUATION

Tables 7 and 8 sum the quantities of TRI chemicals otherwise used and processed from the various users/data sources presented in Section 6.0. Based on these results, quantities of naphthalene, lead, and xylene exceeded a TRI reporting threshold for 2020 at NBPL.

Per the *Consolidated EPCRA Policy for DoD Installations, Munitions Activities, and Operational Ranges,* September 21, 2006, separate Form Rs for the SAR and the rest of NBPL must be prepared. Because the SAR uses only lead among the three reportable chemicals, only a Form R for lead is required for the SAR.

Table 7. NBPL RY2020 TRI Chemical "Otherwise Used" Threshold Evaluation Summary

Chemical	CAS #	HAZMIN Center (lb)	DFSP NBPL (lb)	NIWC (lb)	FRC Plating Shop (lb)	SWRMC (lb)	PNSY (lb)	NBPL SAR (lb)	Oily Wastewater from Offsite (lb)	Fuel in Non-Motor Vehicles (lb)	AFFF Replacement (lb	Total (lb)
Aluminum (fume or dust)		---	---	---	---	---	---	---	---	---	---	---
Antimony	7440-36-0	---	---	---	---	---	---	25	---	---	---	25
Antimony Compounds	N010	---	---	---	---	---	---	1	---	---	---	1
Ammonia	7664-41-7	----	---	---	---	---	---	---	---	---	---	---
Arsenic	7440-38-2	---	---	---	---	---	---	1	---	---	---	1
Barium	7440-39-3	---	---	---	---	---	---	---	2	---	---	2
Barium Compounds	N040	---	---	---	---	---	---	2	---	---	---	2
Benzene	71-43-2	---	---	---	---	---	---	---	---	---	---	---
Chromium Compounds	N090	---	---	---	---	---	---	---	---	---	---	---
Cobalt Compounds	N096	---	---	---	---	---	---	---	---	---	---	---
Copper Compounds	N100	---	---	---	---	---	---	---	---	---	---	---
Copper	7440-50-8	---	---	---	---	---	---	196	4	---	---	200
Cumene	98-82-8	---	---	---	---	---	3	---	---	---	---	3
Cyanide Compounds	N106	---	---	---	---	---	---	---	---	---	---	---
Dibutyl Phthalate	201-557-4	---	---	---	---	---	2	---	---	---	---	2
Diisocyanates	N120	---	---	102	---	---	---	---	---	---	---	102
Ethylbenzene	100-41-4	---	---	---	---	---	19	---	54	251	---	324
Ethylene Glycol	107-21-1	---	---	---	---	---	135	---	---	---	---	135
Glycol Ethers	N230	---	---	---	---	---	---	---	---	---	284	284
N-Hexane	110-54-3	---	---	---	---	---	7	---	---	---	---	7
Lead	7439-92-1	---	4.8	6	---	---	---	1,292.7	0.3	---	---	1,303.8
Lead Compounds	N420	---	---	---	---	---	---	2.3	---	---	---	2.3
Manganese Compounds	N450	---	---	---	---	---	---	---	---	---	---	---
Methanol	67-56-1	---	---	---	---	1	---	---	---	---	---	1
Mercury	7439-97-6	---	---	---	---	---	---	---	---	---	---	---
Naphthalene	91-20-3	---	>10,000	385	---	8	---	---	164	251	---	>10,000
N-Butanol	71-36-3	---	---	---	---		93	---	---	---	---	93
Nickel	7440-02-0	---	---	---	---	---	---	---	2	---	---	2
Nitrate Compounds	N511	---	---	---	---	---	---	---	---	---	---	---
Nitroglycerin	9010-02-0	---	---	---	---	---	---	4	---	---	---	4
Phenathrene	85-01-8	---	---	---	---	---	---	---	25	---	---	25
Phenol	108-95-2	---	---	---	---	---	---	---	1	---	---	1
Phosphorus	7723-14-0	---	---	---	---	---	---	---	---	---	---	---
Sodium Nitrite	7632-00-0	---	---	---	---	---	---	---	---	---	---	---
Toluene	108-88-3	---	---	---	---	---	8	---	32	---	---	40
1,2,4-Trimethylbenzene	95-63-6	---	---	---	---	---	28	---	632	---	---	660
Xylene	1330-20-7	---	>10,000	---	---	---	48	---	327	---	---	>10,000
Zinc Compounds	N982	---	164	---	---	---	---	---	16	---	---	180

Chemical quantities presented in **bold text** exceeded a TRI reporting threshold 2020.

CAS = Chemical Abstracts Service; DFSP = Defense Fuel Supply Point; FRC = Fleet Readiness Center; HAZMIN = Hazardous Waste Minimization; lb = pound(s); NBPL = Naval Base Point Loma; PNSY = Portsmouth Naval Shipyard; SAR = Small Arms Range; NIWC = Naval Information Warfare Center Pacific; SWRMC = Southwest Regional Maintenance Center

Table 8. NBPL RY2020 TRI Chemical "Processed" Threshold Evaluation Summary

Chemical	CAS #	HAZMIN Center (lb)	DFSP NBPL and Other Fuel (lb)	NIWC (lb)	FRC Plating Shop (lb)	SWRMC (lb)	PNSY (lb)	NBPL SAR (lb)	NBPL OW (lb)	Fuel in Non-Motor Vehicles (lb)	Total (lb)
Barium	7440-39-3	---	---	---	---	---	---	---	2	---	2
Barium Compounds	N040	---	---	---	---	---	---	---	---	---	---
Benzene	71-43-2	---	62	---	---	---	---	---	---	---	62
Cadmium	7440-43-9	---	---	---	---	---	---	---	---	---	---
Copper Compounds	N100	---	---	---	---	---	---	---	---	---	---
Copper	7440-50-8	---	---	---	---	---	---	---	4	---	4
Chromium	7440-47-3	---	---	---	---	---	---	---	---	---	---
Chromium Compounds	N090	---	---	---	---	---	---	---	---	---	---
Cumene	98-82-8	---	---	---	---	---	---	---	---	---	---
Ethylbenzene	100-41-4	---	1,517	---	---	---	---	---	54	---	1,571
Ethylene Glycol	107-21-1	---	---	---	---	---	---	---	---	---	---
Glycol Ethers	N230	---	---	---	---	---	---	---	---	---	---
Lead	7439-92-1	---	---	---	---	---	---	---	0.2	---	0.2
Lead Compounds	N420	---	---	---	---	---	---	---	---	---	---
Manganese	7439-96-5	---	---	---	---	---	---	---	---	---	0
Manganese Compounds	N450	---	---	---	---	---	---	---	---	---	---
Methanol	67-56-1	---	---	---	---	---	---	---	---	---	---
Mercury	7439-97-6	---	---	---	---	---	---	---	---	---	---
Methyl Isobutyl Ketone	108-10-1	---	---	---	---	---	---	---	---	---	---
Naphthalene	**91-20-3**	**---**	**>25,000**	**---**	**---**	**---**	**---**	**---**	**164**	**---**	**>25,000**
N-Butyl Alcohol	71-36-3	---	---	---	---	---	---	---	---	---	---
Nickel	7440-02-0	---	---	---	---	---	---	---	2	---	2
Phenathrene	85-01-8	---	694	---	---	---	---	---	25	---	719
Phenol	108-95-2	---	---	---	---	---	---	---	1	---	1
Toluene	108-88-3	---	878	---	---	---	---	---	32	---	910
1,2,4-Trimethylbenzene	95-63-6	---	17,691	---	---	---	---	---	632	---	18,323
Xylene	**1330-20-7**	**---**	**8,952**	**---**	**---**	**---**	**---**	**---**	**328**	**---**	**9,280**
Zinc Compounds	N982	---	---	---	---	---	---	---	16	---	15

Chemical quantities presented in **bold text** exceeded a TRI reporting threshold 2020.

CAS = Chemical Abstracts Service; DFSP = Defense Fuel Supply Point; FRC = Fleet Readiness Center; HAZMIN = Hazardous Waste Minimization; lb = pound(s); NBPL = Naval Base Point Loma; OW = Oily Water; PNSY = Portsmouth Naval Shipyard; SAR = Small Arms Range; NIWC = Naval Information Warfare Center Pacific; SWRMC = Southwest Regional Maintenance Center

8.0 FORM R CALCULATIONS – NAPHTHALENE

8.1 Air Releases of Naphthalene from JP5

JP5 at NBPL is received into three large ASTs at NSFLCSD/DFSP fuel storage tanks and then transferred when needed to ships, yard oilers, and tank trucks. A significant portion of the JP5 is pumped from NSFLCSD/DFSP to NASNI and MCAS Miramar via pipeline.

The three ASTs each hold 5.2 million gal of fuel. Naphthalene in JP5 is released to air primarily during filling of the three ASTs, and from there, during the filling of ship and yard oiler fuel tanks, as well as tank trucks. Naphthalene can also be released from leaks from pumps, valves, and fittings in piping used to transfer the fuel.

These air releases from potential leaks were estimated using USEPA's "Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities" (EPA-745-R-99-005), March 1999. These look-up tables are appropriate given that JP5 handling at NSFLCSD/DFSP is very similar to the process of a chemical distributor (receipt, storage, and transfer of a liquid into containers). The look-up tables allow estimation of the various categories of air releases from this process based on the throughput of the chemical in question (i.e., the quantity of the chemical passing through the process). The tables are based on AP-42 storage tank air release algorithms, Synthetic Organic Chemical Manufacturing Industry (SOCMI) emission factors for piping components, and standard engineering factors for air release from container (i.e., vehicle fuel tank) filling. The tables can be applied to mixtures of chemicals (such as JP5) by assuming that each chemical component is "unmixed," and only the throughput quantity of the pure chemical is used. This approach works very well for most organic chemicals (such as those in JP5), but not very well for polar chemical compounds. Also, the look-up tables assume that no air emission control systems are in place, as is the case at the NSFLCSD/DFSP Point Loma facility.

The following paragraphs present naphthalene air emission estimates from the JP5 storage and processing derived from JP5 throughput for the year, the naphthalene content of the JP5 (0.37%) and the naphthalene look-up table (page A-45 of EPA-745-R-99-005).

- Quantity of naphthalene throughput in JP5
  = 32,467,390 gal x 6.79 lb/gal x 0.0037 = 815,678 lb naphthalene

It is assumed that JP5 throughput is evenly distributed among the three ASTs based on their capacity. When addressing only the naphthalene, the capacity of the three tanks "shrinks" proportionally to the concentration of naphthalene in the JP5:

- 5,200,000 gal x 0.0037 = 19,240 gal

Thus, in the simulation, three tanks each have a capacity of approximately 19,000 gal. The 2020 throughput of naphthalene through each tank is:

- 815,678 lb/3 = 271,893 lb, which rounds to 300,000 lb for this calculation

The look-up tables address six air emission vectors (A1 – A6):

A1 – Container (i.e., ship fuel tank, yard oiler, tank truck) filling emissions:

For 250,000 lb throughput = 1 lb naphthalene (from naphthalene look-up table).

For 500,000 lb throughput = 1 lb naphthalene (from naphthalene look-up table).

Therefore, 300,000 lb throughput yields 1 lb naphthalene. This value must be multiplied by the geographical correction factor for southern California of 1.2 = 1 x 1.2 = 1.2 lb naphthalene.

A2 – Piping component leaks – delivery of liquid to container (i.e., ship tank, yard oiler, or tank truck):

For 250,000 lb throughput = 3 lb naphthalene (from naphthalene look-up table).

For 500,000 lb throughput = 6 lb naphthalene (from naphthalene look-up table).

Therefore, 300,000 lb throughput yields 3.6 lb naphthalene. A geographical correction factor is not required for this release vector.

A3 – Storage tank working and breathing emissions:

For 250,000 lb throughput = 1 lb naphthalene (from naphthalene look-up table).

For 500,000 lb throughput = 1 lb naphthalene (from naphthalene look-up table).

Therefore,300,000 lb throughput yields 1 lb naphthalene. This value must be multiplied by the geographical correction factor for southern California of 1.2 = 1 x 1.2 = 1.2 lb naphthalene.

A4 – Piping component leaks – delivery of liquid to storage tank:

For 250,000 lb throughput = 1 lb naphthalene (from naphthalene look-up table).

For 500,000 lb throughput = 1 lb naphthalene (from naphthalene look-up table).

Therefore, 300,000 lb throughput yields 1 lb naphthalene. A geographical correction factor is not required for this release vector.

A5 – Blending/mixing tank emissions: Not applicable.

A6 – Piping component leaks – delivery of liquid to blending/mixing tank: Not applicable.

Point source air releases per tank = A1 + A3 = 1.2 + 1.2 = 2.4 lb/tank
Non-point source emissions per tank = A2 + A4 = 3.6 + 1.0 = 4.6 lb/tank

JP5 point source air releases = 2.4 lb/tank x 3 tanks = 7.2 lb naphthalene
JP5 non-point source emissions = 4.6 lb/tank x 3 tanks = 13.8 lb naphthalene

8.2 Air Releases of Naphthalene from DFM

DFM at NBPL is received into five large ASTs at the fuel depot and then transferred when needed into the ships, yard oilers, and tank trucks. Each AST has a capacity of 5.2 million gal.

Naphthalene in DFM is released to air primarily during filling of the five DFM ASTs and, from there, during the filling of ship fuel tanks, yard oilers, or tank trucks. It is also released from leaks from pumps, valves, and fittings in piping used to transfer the fuel. As with naphthalene releases from JP5, these air releases were estimated using USEPA's *"Look-up Tables for Estimating Toxic Release Inventory Air Emissions from Chemical Distribution Facilities"* (EPA-745-R-99-005), March 1999.

NBPL received DFM from two suppliers in 2020, BP West Coast (75%) and Tesoro Refining (25%). According to the SDSs, naphthalene is present in the DFM supplied by BP at a concentration of 1-3% and present in the DFM from Tesoro at a concentration of 1–5%. Per TRI guidelines the midpoint of each range, 2% and 3% respectively was used to determine the amount of naphthalene from each supplier. NBPL received 66,411,809 gal of DFM in 2020.

The following paragraphs present naphthalene air emission estimates from the DFM storage tanks derived from naphthalene look-up table (page A-45 of the reference):

- Quantity of naphthalene throughput in DFM = (66,411,809 gal x 7.17 lb/gal x .02 x 0.75) + (66,411,809 gal x 7.17 lb/gal x .03 x 0.25) = 10,713,885 lb naphthalene

It is assumed that DFM throughput is evenly distributed among the five storage tanks based on their capacity. When addressing only the naphthalene, the capacity of the five tanks “shrinks” proportionally to the concentration of naphthalene in the DFM (the highest concentration is used for the estimate):

- 5,200,000 gal x 0.03 = 156,000 gal

Thus, in this simulation, five tanks each have a capacity of 156,000 gal. The 2020 throughput of naphthalene through each tank is:

- 10,713,885 lb ÷ 5 = 2,142,777 lb ≅ 2,000,000 lb[34]

A1 – Container (i.e., vehicle fuel tank) filling emissions:

For 2,000,000 lb throughput = 1b naphthalene (from naphthalene look-up table).

This value must be multiplied by the geographical correction factor for southern California of 1.2 = 1 x 1.2 = 1.2 lb naphthalene.

A2 – Piping component leaks – delivery of liquid to container (i.e., vehicle fuel tank):

For 2,000,000 lb throughput = 22 lb naphthalene (from naphthalene look-up table).

A geographical correction factor is not required for this release vector.

A3 – Storage tank working and breathing emissions:

For 2,000,000 lb throughput = 2 lb naphthalene (from naphthalene look-up table for 25,000 gal tank).

Extrapolating this amount to represent a 156,000 gal tank yields 10.6 lb naphthalene. This value must be multiplied by the geographical correction factor for southern California of 1.2 = 10.6 x 1.2 = 12.7 lb naphthalene.

A4 – Piping component leaks – delivery of liquid to storage tank:

For 2,000,000 lb throughput = 6 lb naphthalene (from naphthalene look-up table).

A geographical correction factor is not required for this release vector.

A5 – Blending/mixing tank emissions: Not applicable.

A6 – Piping component leaks – delivery of liquid to blending/mixing tank: Not applicable.

Point source air releases per tank = A1 + A3 = 1.2 + 12.7 = 13.9 lb/tank
Non-point source emissions per tank = A2 + A4 = 22 + 6 = 28 lb/tank

DFM point source air releases = 13.9 lb/tank x 5 tanks = 69.5 lb naphthalene
DFM non-point source emissions = 28 lb/tank x 5 tanks = 140 lb naphthalene

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[34] This simplification will not reduce the accuracy of this calculation.

8.3 Air Releases of Naphthalene from Recovered Oil Tank and FOR

Oil recovered from the FOR is stored in a 420,000-gal AST prior to dispensing to tank trucks or barges that transport the oil to the vendors that purchased the material. Naphthalene in the recovered oil is released to air primarily during filling of the tank and, from there, during the filling of tank trucks and barges. It is also released from potential leaks from pumps, valves, and fittings in piping used to transfer the fuel.

As discussed in Section 6.2.5, 1,119,510 gal of oil were recovered from the FOR in 2020. The naphthalene content of the oil is unknown, but was assumed to be 476 mg/L based on analyses of recovered oil from the NASNI OW:

- 489 mg/L naphthalene x 1,119,510 gal x 3.78 L/gal x 1 lb/453,590 mg = 4,562 lb naphthalene (sold – not reported on Form R)

Air releases of naphthalene from this small amount of throughput will be negligible compared with air releases from the JP5 and DFM tanks that had over 11 million lb of naphthalene throughput. The air releases would be lost in the rounding of the final estimate to two significant figures.

8.4 Naphthalene Recovered from the FOR System

As discussed in Section 6.2.5, the fuel recovered from the FOR system is sold to offsite vendors for the highest price (typically over $1 per gal). The wastewater generated from this process is discharged to MWWD sanitary sewers.

In 2020, 1,119,510 gal of salable fuel were recovered from the FOR, and 2,606,000 gal of wastewater were sent to MWWD sanitary sewers from this process.[35] As discussed in Sections 6.2.5 and 8.2, the amount of naphthalene in the recovered fuel was 4,562 lb. Because the recovered oil (including the naphthalene) is sold, this material is considered processed and not recycled offsite. It does not need to be reported on the Form R.[36]

8.5 Naphthalene Discharged to San Diego MWWD from the FOR

Naphthalene in wastewater discharged from the FOR system to MWWD sanitary sewers is reported as a transfer to a POTW. A total of 2,606,000 gal of wastewater were discharged in 2020 from the FOR; however, analytical data for specific chemical constituents in the wastewater are not available. Naphthalene concentration data for wastewater discharged from the NASNI OW are available and used here:[37]

- 0.15 mg/L naphthalene x 2,606,000 gal x 3.78 L/gal x 1 lb/453,590 mg = 3.2 lb naphthalene to POTW

8.6 Naphthalene in FOR Sludge and Tank Bottom Waste Sent Offsite to NASNI

According to Michael Carter (Southwest Regional Fuels Director, NAVSUP FLC San Diego), no FOR sludge or inter-phase waste was sent offsite in 2020; however, 38,710 gal of tank bottom wastes were removed from Tanks 3 and 6.[38] This waste was sent to the NASNI OW. Assuming

[35] Michael Carter email, June 6, 2021.

[36] Discussion held during the December 2020 Civil Engineer Corps Officer School (CECOS) DoD TRI Training Course.

[37] NASNI OW effluent composition data obtained from an average of quarterly samples collected from 2016–2020.

[38] Tuong Nguyen, Southwest Regional Environmental Protection Specialist NAVSUP FLC San Diego email, June 24, 2021.

that the naphthalene concentration in the tank bottom waste is the same as the concentration in DFM (3%), then the amount of naphthalene shipped offsite in this waste stream would be:

- 38,710 gal x 6.672 L/gal x 0.03 lb naphthalene = 7,748 lb naphthalene

8.7 Naphthalene Sent Offsite in Waste Absorbent, Fuel Filters, and Waste Petroleum, Oil, and Lubricant (POL)

Waste absorbents from NSFLCSD/DFSP contain a small quantity of JP5 and DFM. Waste turn-in data obtained from NES indicate that 750 lb of “debris, POL, containing free-flowing liquids” (waste profile number HP24) were generated by NSFLCSD/DFSP in 2020 and then sent offsite for disposal. Assuming that 50% of this material is liquid POL, and assuming that the naphthalene concentration in the POL is the same as the concentration in DFM (3%), then the amount of naphthalene shipped offsite in this waste stream would be:[39]

- 750 lb waste x 0.5 lb POL/lb waste x 0.03 lb naphthalene/lb POL = 11.3 lb naphthalene (transferred to AA Sydcol, LLC)

Waste turn-in data obtained from NES indicate that 2,069 lb of “debris, oil, dry” (waste profile number HT8A) were generated by NSFLCSD/DFSP in 2020 and then sent offsite for disposal. Assuming that 50% of this material is liquid POL, and assuming that the naphthalene concentration in the POL is the same as the concentration in DFM (3%), then the amount of naphthalene shipped offsite in this waste stream would be:

- 2,069 lb waste x 0.5 lb POL/lb waste x 0.03 lb naphthalene/lb POL = 31 lb naphthalene (transferred to AA Sydcol, LLC)

Waste turn-in data obtained from NES indicate that 0 lb of fuel filters (waste code HI14) were sent offsite for energy recovery from NSFLCSD/DFSP in 2020.

Waste turn-in data obtained from NES indicate that 0 lb of waste POL (waste code RP15) were sent offsite for recycle from NSFLCSD/DFSP in 2020.

8.8 Naphthalene Released to Water and Land from JP5 and DFM

Leaks and spills of JP5 and DFM have the potential for naphthalene releases during storage and fueling operations. Based on input from Michael Carter, no significant spills or releases of JP5 to the water occurred from NSFLCSD/DFSP in 2020.[40] Thus, the amount of naphthalene lost to San Diego Bay in this manner is 0 lb, as is the amount released to land onsite. Minor leaks and spills would have been cleaned up with absorbents and are accounted for in Section 8.7.

8.9 Naphthalene in JP5 and DFM Recovered from Tank Farm Remediation Activities

In 2020, JP5 and DFM fuels were recovered from various ongoing remedial activities at NSFLCSD/DFSP. The remedial activities included extracting groundwater from wells installed near the NSFLCSD/DFSP fuel tanks. The extracted groundwater is treated onsite through an oil/water separator, followed by either a reverse osmosis treatment system or a carbon and clay filtration system, prior to discharge to MWWD sanitary sewers (Connection 220). This system is referred to as the groundwater remediation system.

[39] Calculation performed using the more conservative concentration of naphthalene found in DFM supplied to NBPL.

[40] Michael Carter email, June 6, 2021.

Based on records provided by Aptim, Incorporated (Aptim) 10,016,140 gal of extracted groundwater were treated through the groundwater remediation system in 2020. Eleven analytical data points for the treated wastewater show an average total petroleum hydrocarbon (TPH) content (as JP5) of 0.64 mg/L.[41] The amount of naphthalene transferred offsite to the POTW is estimated as follows assuming that naphthalene represents 3% of the TPH content as diesel:

- 10,016,140 gal x 0.64 mg/L TPH x 3.78 L/gal x 1 lb/453,590 mg x
  3 lb naphthalene/100 lb TPH = 1.6 lb naphthalene

This amount will also be reported in Section 8.8 of the Form R.[42]

Aptim also reported 18,617 gal of oil recovered from the groundwater remediation system in 2020. No analytical data for the recovered oil are available; however, the amount of naphthalene in the oil is estimated using sampling data from the NASNI OW in Section 6.10:

- 489 mg/L naphthalene x 18,617 gal x 3.78 L/gal x 1 lb/453,590 mg = 76 lb naphthalene (sold – not reported on Form R)[43]

Remedial activities at the NSFLCSD/DFSP generated other wastes (e.g., drilling mud or soils) during 2020.[44] Based on records provided by Aptim, no spent carbon or spent clay from the remediation system was sent offsite.

According to Aptim, 1 drum of sludge and 16 drums of spent bag filters were shipped to the NBPL hazardous waste staging yard from the remediation system during 2020; however, no analytical data are available for this waste. It is assumed that the bag filters and sludge contain no appreciable quantity of naphthalene.

8.10 Releases of Naphthalene from Material Other Than JP5 and DFM

As presented in Section 6.11, 251 lb of naphthalene were used to fuel emergency generators, welders, pumps, and air compressors around the base. As with naphthalene in all fuels, the chemical would be almost entirely combusted during use. Small quantities of naphthalene releases from this use would be insignificant compared with the releases estimated above for JP5 and DFM, and would be lost in the rounding of estimates to no more than two significant figures on the Form R.

As presented in Section 6.5, SWRMC indicated that approximately 8 lb of naphthalene were used in paints during 2020. It is assumed this naphthalene was released to air from fugitive sources.

As presented in Section 6.3, NIWC Pacific reported 385 lb of naphthalene in diesel fuel used in emergency generators during 2020. As discussed above, naphthalene air emissions from diesel fuel combustion would be insignificant at this fuel use amount.

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[41] "Replacement Recovery System" samples taken monthly in 2020; eight of the samples had detected results.

[42] Section 8.8 includes quantities of toxic chemicals disposed of or otherwise released onsite or managed as a waste offsite because of remedial actions not associated with the production process. Toxic Chemical Release Inventory Reporting Forms and Instructions Revised 2020 Version, EPA 740-B-21-001, March 2021, page 84.

[43] According to a June 10, 2021, email from Aptim, the oil recovered from the groundwater remediation system was sold to offsite recycler, World Oil Environmental Services.

[44] Email from Mark Unruh of Aptim, June 10, 2021.

As discussed in Section 6.10, releases of naphthalene from the NBPL OW must be accounted for on the Form R:

- Naphthalene to NASNI OW in recovered oil stream = 163 lb
- Naphthalene to MWWD sanitary sewers (POTW) = 1.2 lb
- Naphthalene in filter cake = 0 lb

8.11 Naphthalene Summary

Naphthalene releases and offsite transfers estimated in Sections 8.1 through 8.9 are summarized below by the Form R sections in which they must be reported. For example, Section 5.1 of the Form R contains the sum of all non-exempt, fugitive air releases of naphthalene from NBPL.

5.1 Releases to air (fugitive/non-point) = 13.8 + 140 + 8 = 161.8 lb, which rounds to 160 lb
5.2 Releases to air (stack/point source) = 7.2 + 69.5 = 76.7, which rounds to 77 lb
5.3.1 Releases to water = 0 lb
5.5.4 Disposal to land onsite, other disposal = 0 lb
6.1 Transfers to POTW = FOR + GW + OW = 3.2 + 1.6 + 1.2 = 6 lb
6.2.0 Transfers to NASNI = tank bottom waste + OW oil = 7,748 + 163 = 7,911 which rounds to 7,900 lb
6.2.1 Transfers to offsite locations (absorbents + OW filter cake to AA Sydcol) = 11.3 + 31 + 0 = 42.3, which rounds to 42 lb
8.8 Remediation wastes = 1.6 lb

9.0 FORM R CALCULATIONS – LEAD

9.1 Lead Use at Small Arms Range

TRI-DDS was used to support the TRI release calculations for the NBPL SAR. Based on munitions type and usage quantity, TRI-DDS calculates chemical-specific air releases and non-air releases for ranges using DoD-developed emission factors, mass balance assumptions, and munitions constituent data.

9.1.1 Air Releases from the NBPL Small Arms Range

The air releases value is the amount of chemical that can be expected to be released to air either as a point source (within range activity) or a fugitive source (outside range activity). Because the NBPL SAR is an open roof range, air emissions can be fugitive or stack air releases. Per the TRI-DDS instructions, metal air release estimates are based on mass balance approach, or Code C, on the Form R.

Based on DoD TRI-DDS, there were 0 lb of lead air releases from the NBPL SAR due to munitions usage. Therefore, because range activities are within/outside, both stack and fugitive air releases were reported to be 0 lb on the Form R.

9.1.2 Non-Air Releases from the NBPL Small Arms Range

Potential chemical releases to land, water, and/or transfers offsite are estimated using the quantity of non-air releases from TRI-DDS, augmented with user knowledge regarding the type of range, use of bullet traps, and range clearance activities performed during the reporting year. If bullet traps are 100% efficient, releases to land are assumed to be 0 lb, and the amount reclaimed from the trap is deducted from the non-air releases quantity. If range clearance activities are conducted, this information is to be used to estimate quantities of TRI chemicals transferred offsite, further reducing the non-air releases quantity. If there are no other potential media streams for release (e.g., to water), the remainder of the non-air releases quantity would then be reported as released to land – other disposal (Section 5.5.4 of the Form R).

The NBPL SAR is a fixed outdoor range (pistol, shotgun, and rifle) with a bullet trap equipped to capture and separate projectiles for metal reclamation. The captured bullets are collected in buckets that are periodically sent offsite for metal recycling. The range is also equipped with wood baffles on the ceiling and walls surrounding the shooting lanes to capture potential ricochets. Routinely, the lanes are cleaned of any debris that may accumulate from range activities (e.g., wood fragments from baffling, ammunition wads from shot gun shells, bullet fragments, target fragments), and this material is sent offsite as hazardous waste for disposal.

TRI-DDS calculated 1,292.7 lb of lead non-air releases for the NBPL SAR. Releases to land onsite from range activities are not applicable because the bullet traps and baffling are 100% efficient (no releases to land are assumed possible for this type of range). It is assumed that 1,292.7 lb of non-air releases represent the lead contained in projectiles captured by the bullet trap system and small amounts contained in cleanup debris and to be accounted for in RY2020.

The Regional Recycling Operations Center at NBSD reported receiving 2,524 lb of range lead from the NBPL SAR in 2020, which were sent offsite for recycling. The material is ultimately sold to various vendors, but primarily through IMS Recycling Services. The quantity of range lead picked up during 2020 represents a larger quantity of lead than was fired in the SAR. In 2019, the last range lead pick-up was in November, leaving some of the expended lead in the range to be picked up in 2020.

Additionally, the NBPL SAR was closed for renovation from June to September 2020 for a change-out of the dust collection system. This waste stream is sent offsite as hazardous waste for disposal. Based on 2020 waste turn-in documents, these activities generated 8,283 lb of lead-contaminated material that were shipped to the U.S. Ecology facility in Beatty, Nevada (NV) (USEPA ID # NVT330010000) for disposal. This waste material comprises primarily wood, plastic, and foam debris, sweepings, and target material. The profile for this waste stream states that this material could contain from 0 to 5% lead by weight.[45] Using the high end of this range, it is estimated the amount sent offsite for disposal is as follows:

- Lead transferred to U.S. Ecology = 8,283 lb range waste x 5% lead = 414 lb lead

Stormwater that falls on the range and that could be contaminated with lead is captured, containerized, and sent to the NASNI Industrial Wastewater Treatment Plant (IW) for treatment. However, this waste stream has never accounted for over 0.05 lb of lead in previous years and is assumed to be 0.0 lb for 2020.

[45] NAVFAC SW San Diego Hazardous Waste Profile for HT43, Debris & Media, Lead Contaminated from Gun Range (wood, lead, plastic, and foam) lists chemical composition of lead at 0 to 5%. Profile provided by Gilberto Orozco, NES Profile Specialist, to Natalie Baum, MMEC Group, on May 26, 2021

Lead releases and offsite transfers for the NBPL SAR are summarized below by the Form R sections in which they must be reported. For example, Section 5.1 of the Form R contains the sum of all non-exempt, fugitive air releases of lead from NBPL.

5.1 Releases to air (fugitive/non-point source) = 0 lb
5.2 Releases to air (stack/point source) = 0 lb
5.3.1 Releases to water = 0 lb
6.1 Transfers to POTW = Not applicable
6.2.1 Transfers to offsite locations (U.S. Ecology) = 414 lb
6.2.2 Transfers to offsite locations (Regional Recycling Operations Center) = 2,524 lb

9.2 Lead Use at the Remainder of NBPL

Per the NBPL RY2020 TRI Chemical Threshold Evaluation Summary (Tables 7 and 8), other organizations other than the SAR used lead in 2020. Releases and offsite transfers of lead from these organizations must be accounted for on a separate lead Form R covering all of NBPL, except the SAR. Lead from the FOR and NBPL OW must also be accounted for on this Form R.

9.2.1 Lead at HAZMIN Center

A review of the HAZMIN Center data indicates that 0 lb of lead were in materials used by NBPL shops and tenants.

9.2.2 Lead from NIWC Pacific

A total of 6.0 lb of lead used in solder were reported from NIWC Pacific. It is assumed that there are no quantifiable releases from this activity. The vast majority of lead would remain on parts that were soldered.

9.2.3 Lead in Recovered Oil from the FOR System

As discussed in Section 6.2.5, fuel recovered from the FOR system is sold to offsite vendors for the highest price (typically over $1 per gal). The wastewater generated from this process is discharged to the MWWD.

In 2020, 1,119,510 gal of salable fuel were recovered from the FOR. Because the recovered oil (including the 4.8 lb of lead) is sold, this material is considered processed and not recycled offsite. It does not need to be reported on the Form R.[46]

9.2.4 Lead Discharged to San Diego MWWD from the FOR

Lead in wastewater discharged from the FOR system is reported as a transfer to a POTW (Section 6.10). A total of 2,606,000 gal of wastewater were discharged in 2020 from the FOR; however, analytical data for specific chemical constituents in the wastewater are not available. Lead concentration data for wastewater discharged from the NASNI OW are available and used here:[47]

- 0.002 mg/L lead x 2,606,000 gal x 3.78 L/gal x 1 lb/453,590 mg = 0.1 lb lead to MWWD

[46] Discussion held during the December 2020 CECOS DoD TRI Training Course.

[47] NASNI OW effluent composition data are an average of quarterly samples collected since 2016.

9.2.5 Lead in FOR Sludge and Tank Bottom Waste Sent Offsite to NASNI

According to Michael Carter (Southwest Regional Fuels Director, NAVSUP FLC San Diego), no FOR sludge or inter-phase waste was sent offsite in 2020; however, 38,710 gal of tank bottom wastes were removed from Tanks 3 and 6.[48] This waste was sent to the NASNI OW. Lead is not a component in either JP-5 or DFM and is not expected to be in the tank bottom waste.

9.2.6 Lead from NBPL OW

As presented in Section 6.10, releases of lead from the NBPL OW must be accounted for on the Form R:

- Lead to NASNI OW in recovered oil stream = 0.2 lb
- Lead to MWWD sanitary sewers (POTW) = 0.0 lb
- Lead in NBPL OW filter cake = 0.1 lb (to AA Sydcol)

9.2.7 Lead from Tank Farm Remediation Activities

In 2020, JP5 and DFM fuel were recovered from various ongoing remedial activities at NSFLCSD/DFSP. The remedial activities included extracting and treating groundwater from wells installed near the NSFLCSD/DFSP fuel tanks. Since November 2014, the extracted groundwater has been treated onsite through an oil/water separator, followed by either a reverse osmosis treatment system or a carbon and clay filtration system, prior to discharge to MWWD sanitary sewers (Connection 220). This system is referred to as the groundwater remediation system.

Based on records provided by Aptim, 10,016,140 gal of extracted groundwater were treated through the groundwater remediation system in 2020. No lead analytical data for the treated groundwater are available; however, given the robust reverse osmosis treatment provided and the fact that naphthalene releases from Connection 220 were 0 lb, it is assumed that lead releases from the groundwater remediation system were 0.0 lb in 2020.

This amount will also be reported in Section 8.8 of the Form R.[49]

Aptim also reported 18,617 gal of oil recovered from the groundwater remediation system in 2020. Analytical data for the recovered oil are not available; therefore, the amount of lead transferred offsite in the oil is estimated using sample data from the NASNI OW in Section 6.10:

- 0.5 mg/L lead x 18,617 gal x 3.78 L/gal x 1 lb/453,590 mg = 0.1 lb lead (sold-not reported on Form R) [50]

Remedial activities at the NSFLCSD/DFSP generated other wastes (e.g., drilling mud or soils) during 2020.[51] Based on records provided by Aptim, no spent carbon or spent clay from the remediation system was sent offsite.

Additionally, 1 drum of sludge and 16 drums of used bag filters from the remediation system were sent offsite in 2020; however, no analytical data are available for this waste, and the

[48] Tuong Nguyen, Southwest Regional Environmental Protection Specialist NAVSUP FLC San Diego email, June 24, 2021.

[49] Section 8.8 includes quantities of toxic chemicals disposed of or otherwise released onsite or managed as a waste offsite because of remedial actions not associated with the production process. Toxic Chemical Release Inventory Reporting Forms and Instructions Revised 2019 Version, EPA 740-R-19-037, January 2020, page 82.

[50] According to a June 10, 2021, email from Aptim, the oil recovered from the groundwater remediation system was sold to offsite recycler, World Oil Environmental Services.

[51] Email from Mark Unruh of Aptim, June 10, 2021.

materials are not expected to contain lead based on the preceding results for the tank farm remediation activities.

9.2.8 Lead Summary for the Remainder of NBPL

Lead releases and offsite transfers estimated in Sections 9.2.1 through 9.2.7 are summarized below by the Form R sections in which they must be reported. For example, Section 5.1 of the Form R contains the sum of all non-exempt, fugitive air releases of lead from NBPL:

5.1 Releases to air (fugitive/non-point source) = not applicable
5.2 Releases to air (stack/point source) = not applicable
5.3.1 Releases to water = not applicable
6.1 Transfers to POTW (FOR + NBPL OW + remediation system) = 0.1 + 0.0 + 0.0 = 0.1 lb
6.2.1 Transfers to offsite locations (NBPL OW filter cake to AA Sydcol) = 0.1 lb
6.2.2 Transfers to offsite locations (NBPL OW recovered oil + tank bottom waste to NASNI) = 0.2 + 0.0 = 0.2 lb
8.8 Remediation wastes = 0.0 lb

10.0 FORM R CALCULATIONS – XYLENE

10.1 Air Releases of Xylene from DFM

NBPL received DFM from two suppliers in 2020, BP West Coast (75%) and Tesoro Refining (25%). According to the SDSs, xylene is present only in the DFM supplied by Tesoro at a concentration of 1–5%. Per TRI reporting guidelines, the midpoint of the range (3%) will be used to determine the amount of xylene in the Tesoro DFM. NBPL received approximately 16,602,952 gal of DFM from Tesoro in 2020 (i.e., 25% of the total DFM throughput).

The following paragraphs present xylene air emission estimates from the DFM storage tanks derived from xylene look-up table (page A-56 of the reference):

- Quantity of xylene throughput in DFM = 16,602,952 gal x 0.86 x 8.34 lb/gal x .03 = 3,572,490 lb xylene

It is assumed that DFM throughput is evenly distributed among the five storage tanks based on their capacity. When addressing only the xylene, the capacity of the five tanks “shrinks” proportionally to the concentration of xylene in the DFM:

- 5,200,000 gal x 0.03 = 156,000 gal

Thus, in this simulation, five tanks each have a capacity of 156,000 gal. The 2020 throughput of xylene through each tank is:

- 3,572,490 lb ÷ 5 = 714,498 lb ≅ 750,000 lb[52]

A1 – Container (i.e., vehicle fuel tank) filling emissions:

For 750,000 lb throughput = 27 lb xylene (from xylene look-up table).

This value must be multiplied by the geographical correction factor for southern California of 1.2 = 27 x 1.2 = 32.4 lb xylene.

A2 – Piping component leaks – delivery of liquid to container (i.e., vehicle fuel tank):

[52] This simplification will not reduce the accuracy of this calculation.

For 750,000 lb throughput = 8 lb xylene (from xylene look-up table).

A geographical correction factor is not required for this release vector.

A3 – Storage tank working and breathing emissions:

For 750,000 lb throughput = 57 lb xylene (from xylene look-up table for 25,000 gal tank).

Extrapolating this amount to represent a 156,000 gal tank yields 275 lb xylene. This value must be multiplied by the geographical correction factor for southern California of 1.2 = 275 x 1.2 = 330 lb xylene.

A4 – Piping component leaks – delivery of liquid to storage tank:

For 750,000 lb throughput = 2 lb xylene (from xylene look-up table).

A geographical correction factor is not required for this release vector.

A5 – Blending/mixing tank emissions: Not applicable.

A6 – Piping component leaks – delivery of liquid to blending/mixing tank: Not applicable.

Point source air releases per tank = A1 + A3 = 32.4 + 275 = 307 lb/tank
Non-point source emissions per tank = A2 + A4 = 8 + 2 = 10 lb/tank

DFM point source air releases = 307 lb/tank x 5 tanks = 1,535 lb xylene
DFM non-point source emissions = 10 lb/tank x 5 tanks = 50 lb xylene

10.2 Air Releases of Xylene from Recovered Oil Tank and FOR

Oil recovered from the FOR is stored in a 420,000-gal AST prior to dispensing to tank trucks or barges that transport the oil to the vendors that purchased the material. Xylene in the recovered oil is released to air primarily during filling of the tank and, from there, during the filling of tank trucks and barges. It is also released from leaks from pumps, valves, and fittings in piping used to transfer the fuel.

As discussed in Section 6.2.5, 1,119,510 gal of oil were recovered from the FOR in 2020. The xylene content of the oil is unknown, but was assumed to be 960 mg/L earlier in this document based on analyses of recovered oil from a similar process at NASNI:

- 960 mg/L xylene x 1,119,510 gal x 3.78 L/gal x 1 lb/453,590 mg = 8,956 lb xylene

Air releases of xylene from the processing of the relatively small amount of recovered oil (based on historical data) would be negligible compared with air releases from the DFM tanks that had greater than 3.5 million lb of xylene throughput. The air releases would be lost in the rounding of the final estimate to two significant figures.

10.3 Xylene Recovered from the FOR System

As discussed earlier in this document, the fuel recovered from the FOR system is sold to offsite vendors for the highest price (typically over $1 per gal). The wastewater generated from this process is discharged to MWWD sanitary sewers.

In 2020, 1,119,510 gal of salable fuel were recovered from the FOR. Because the recovered oil (including the xylene) is sold, this material is considered processed and not recycled offsite. It does not need to be reported on the Form R.[53]

10.4 Xylene Discharged to San Diego MWWD from the FOR

Xylene in wastewater discharged from the FOR system to MWWD sanitary sewers is reported as a transfer to a POTW. A total of 2,606,000 gal of wastewater were discharged in 2020 from the FOR; however, analytical data for specific chemical constituents in the wastewater are not available. Xylene concentration data for wastewater discharged from the NASNI OW are available and used here.

The amount of xylene discharged to the POTW from the FOR is calculated as follows:[54]

- 0.11 mg/L xylene x 2,606,000 gal x 3.78 L/gal x 1 lb/453,590 mg = 2.3 lb xylene to POTW

10.5 Xylene in FOR Sludge and Tank Bottom Waste Sent Offsite to NASNI

According to Michael Carter (Southwest Regional Fuels Director, NAVSUP FLC San Diego), no FOR sludge or inter-phase waste was sent offsite in 2020; however, 38,710 gal of tank bottom wastes were removed from Tanks 3 and 6.[55] This waste was sent to the NASNI OW. Assuming that the xylene concentration in the tank bottom waste is the same as the concentration in DFM (3%), then the amount of xylene shipped offsite in this waste stream would be:

- 38,710 gal x 6.672 L/gal x 0.03 lb xylene = 7,748 lb naphthalene

10.6 Xylene Sent Offsite In Waste Absorbent, Fuel Filters, and Waste POL

Waste absorbents from NSFLCSD/DFSP contain a small quantity of DFM. Waste turn-in data from Noreas Environmental Services indicate that 750 lb of “debris, POL, containing free-flowing liquids” (waste profile numbers HP24) were generated by NSFLCSD/DFSP in 2020 and then sent offsite for disposal. Assuming that 50% of this material is liquid POL, and assuming that the xylene concentration in the POL is the same as the concentration in DFM (3%), then the amount of xylene shipped offsite in this waste stream would be:

- 750 lb waste x 0.5 lb POL/lb waste x 0.03 lb xylene/lb POL = 11 lb xylene (transferred to AA Sydcol, LLC)

Waste absorbents from NSFLCSD/DFSP contain a small quantity of DFM. Waste turn-in data from Noreas Environmental Services indicate that 2,069 lb of “debris, oil, dry” (waste profile number HT8A) were generated by NSFLCSD/DFSP in 2020 and then sent offsite for disposal. Assuming that 50% of this material is liquid POL, and assuming that the xylene concentration in the POL is the same as the concentration in DFM (3%), then the amount of xylene shipped offsite in this waste stream would be:

- 2,069 lb waste x 0.5 lb POL/lb waste x 0.03 lb xylene/lb POL = 31 lb xylene (transferred to AA Sydcol, LLC)

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[53] Discussion held during the December 2020 CECOS DoD TRI Training Course.

[54] NASNI OW effluent composition data obtained from an average of quarterly samples collected from 2016–2020.

[55] Tuong Nguyen, Southwest Regional Environmental Protection Specialist NAVSUP FLC San Diego email, June 24, 2021.

Waste turn-in data from Noreas Environmental Services indicate that 0 lb of fuel filters (waste code HI14) were sent offsite for energy recovery from NSFLCSD/DFSP in 2020.

Waste turn-in data from Noreas Environmental Services indicate that 0 lb of waste POL (waste code RP15) were sent offsite for recycle from NSFLCSD/DFSP in 2020.

10.7 Xylene Released to Water and Land from DFM

Leaks and spills of DFM have a potential for xylene releases during storage and fueling operations. Based on input from Michael Carter, no significant spills or releases of DFM to the water occurred in 2020.[56] Thus, the amount of xylene lost to San Diego Bay in this manner is 0 lb, as is the amount released to land onsite. Minor leaks and spills would have been cleaned up with absorbents and are accounted for in Section 10.6.

10.8 Xylene in DFM Recovered from Tank Farm Remediation Activities

In 2020, DFM fuels were recovered from various ongoing remedial activities at NSFLCSD/DFSP. The remedial activities included extracting groundwater from wells installed in the vicinity of the NSFLCSD/DFSP fuel tanks. The extracted groundwater is treated onsite through an oil/water separator, followed by either a reverse osmosis treatment system or a carbon and clay filtration system, prior to discharge to MWWD sanitary sewers (Connection 220). This system is referred to as the groundwater remediation system.

Based on records provided by Aptim, Inc., 10,016,140 gal of extracted groundwater were treated through the groundwater remediation system in 2020. Two analytical data points for the treated wastewater show an average TPH as diesel content of 1.3 mg/L.[57]

The amount of xylene transferred offsite to the POTW is estimated as follows, assuming that xylene represents 3% of the TPH content as diesel:

- 10,016,140 gal x 1.3 mg/L xylene x 3.78 L/gal x 1 lb/453,590 mg x 3 lb xylene/100 lb TPH = 3.3 lb xylene

This amount will also be reported in Section 8.8 of the Form R.[58]

Remedial activities at the NSFLCSD/DFSP in 2020 generated other wastes (e.g., drilling mud or soils) during 2020.[59] Based on records provided by Aptim, no spent carbon or spent clay from the remediation system was sent offsite.

According to Aptim, 1 drum of sludge and 16 drums of spent bag filters were shipped to the NBPL hazardous waste staging yard from the remediation system during 2020; however, no analytical data are available for this waste. Given the lack of xylene identified in the other wastes generated by the tank farm remediation effort during 2020, it is assumed that the bag filters and sludge contain no appreciable quantity of xylene.

56 Michael Carter email, June 10, 2021.

57 "Replacement Recovery System" samples taken in monthly in 2020; eight of the samples had detected results.

58 Section 8.8 includes quantities of toxic chemicals disposed of or otherwise released onsite or managed as a waste offsite because of remedial actions not associated with the production process. Toxic Chemical Release Inventory Reporting Forms and Instructions Revised 2020 Version, EPA 740-B-20-001, March 2021, page 84.

59 Email from Mark Unruh of Aptim, June 10, 2021.

10.9 Releases of Xylene from Materials Other Than DFM

As presented in Section 6.7, PNSY indicated that approximately 48 lb of xylene were used in paint and solvents during 2020. It is assumed this xylene was released to air from fugitive sources.

As discussed in Section 6.10, releases of xylene from the NBPL OW must be accounted for on the Form R:

- Xylene to NASNI OW in recovered oil stream = 319 lb
- Xylene to MWWD sanitary sewers (POTW) = 0 lb
- Xylene in filter cake = 8.1 lb

10.10 Xylene Summary

Xylene releases and offsite transfers estimated in Sections 10.1 through 10.9 are summarized below by the Form R sections in which they must be reported. For example, Section 5.1 of the Form R contains the sum of all non-exempt, fugitive air releases of xylene from NBPL.

5.1 Releases to air (fugitive/non-point) = 50 + 48 = 98 lb
5.2 Releases to air (stack/point) = 1,535 lb, which rounds to 1,500 lb
5.3.1 Releases to water = 0 lb
5.5.4 Disposal to land onsite, other disposal = 0 lb
6.1 Transfers to POTW = NBPL GW + NBPL OW + FOR = 3.3 + 0 + 2.3 = 5.6 lb, rounds to 6 lb
6.2.0 Transfers to NASNI (tank bottom waste + NBPL OW recovered oil) = 7,748 + 319 = 8,067 lb, which rounds to 8,100 lb
6.2.1 Transfers to offsite locations (absorbents + NBPL filter cake to AA Sydcol) = 11 + 31 + 8.1 = 50.1 lb, which rounds to 50 lb
8.8 Remediation waste = NBPL GW POTW = 3.3 lb, which rounds to 3 lb

11.0 TRI FORM R REPORTS

The following NBPL Form R reports for RY2020 will be submitted to USEPA and the State of California by July 1, 2021, via the USEPA Central Data Exchange (CDX):

- Lead
- Naphthalene
- Xylene

Additionally, one Form R report (lead) will be submitted for the NBPL SAR for RY2020.

12.0 KEY CHANGES FROM PRECEDING YEAR

For 2019, xylene did not require a Form R because it was not reported in the DFM SDS used by the previous supplier. The DFM SDS supplied by Tesoro in 2020 lists xylene at concentrations above de minimis levels causing xylene quantities to exceed the otherwise used and processed thresholds for 2020. Xylene is a volatile chemical and, with its inclusion in the list of reportable TRI chemicals for NBPL, total air releases reported for 2020 increased significantly over 2019 levels (1,835 lb versus 35 lb).

The change in DFM suppliers also impacted naphthalene TRI results because it was not reported in the DFM SDS used by the previous supplier. The presence of naphthalene in the DFM from both suppliers in 2020 increased the apparent throughput of this chemical at NBPL and the associated air releases increased from 35 lb in 2019 to 237 lb in 2020. Additionally, two fuel tanks were cleaned out increasing the quantity of naphthalene offsite transfers to increase from 262 lb in 2019 to 7,900 lb in 2020.

The quantity of munitions fired at the SAR decreased by 32% in 2020 when compared with 2019 data because of the four-month closure of the facility for renovation during 2020. This decrease in munitions use caused a decrease in lead sent offsite for recycle in 2020 (2,524 lb) compared with 2019 (8,123 lb). (Note that the 2019 quantity of lead sent off-site for recycle was greater than usual because it included lead that was not picked up for recycling during the last few months of 2018.) Conversely, the SAR renovation effort during the four-month closure caused an increase in offsite transfers of lead for disposal in 2020: 414 lb compared with 60 lb in 2019.

There were no significant changes to lead releases from the remainder of NBPL from 2019 to 2020.